Claims

1. Method for phenotyping of a human individual comprising determining *in vivo* protein activity and thereby obtaining a characteristic of said human individual, the determination comprising
   a) hyperpolarising the NMR active nuclei of samples collected from a human individual preadministered with at least one probe compound containing at least one NMR active nuclei, and
   b) analysing said samples by NMR spectroscopy.

2. Method according to claim 1 wherein one probe compound containing at least one NMR active nuclei is used.

3. Method according to claim 1 wherein more than one probe compound containing at least one NMR active nuclei is used.

4. Method according to claims 1 to 3 wherein the activity of several proteins or isoenzymes is determined and thus a set of characteristics of said human individual is obtained.

5. Method according to claims 1 to 4 wherein the method is carried out for several human individuals and thus characteristics of said several human individuals are obtained.

6. Method according to claim 5 wherein human individuals who exhibit the same or similar characteristics are grouped.

7. Method according to claim 6 for phenotyping of a clinical trial group

8. Method according to claims 1 to 4 wherein said characteristic of said human individual is compared with characteristics of other human individuals, preferably having been obtained according to claim 6, and thereby classifying said human individual into a group.

9. Method according to claim 8 for phenotyping of a human individual prior to said human individual receives therapeutic drug treatment.

10. Method according to claims 1 to 9 wherein the at least one probe compound is enriched with NMR active nuclei.

11. Method according to claims 1 to 10 wherein hyperpolarisation is carried out by means of polarisation transfer from a noble gas, brute force, dynamic nuclear polarisation (DNP) or spin refrigeration.

12. Method according to claims 1 to 11 wherein the collected samples are biofluids.

13. Method according to claims 1 to 12 wherein the protein activity to be determined is the activity of a protein selected from the group consisting of NADPH quinone oxireductases, CYP450, N-acetyltransferase, glutathione transferase, thiomethyltransferase, thiopurine methyltransferase, pseudocholinesterase, sulfotransferase, UDP-glucuronosyl transferase, serotonin transport protein, ATP binding cassette (ABC's) and p-glycoprotein.

14. Method according to claims 1 to 13 wherein the at least one probe compound is a substrate, inducer or inhibitor for Cytochrome P 450 (CYP450)

15. Method according to claim 14 wherein the at least one probe compound is a substrate, inducer or inhibitor for a CYP 450 isoenzyme selected from the group consisting of CYP1A2, CYP2A6, CYP2C8/9, CYP2C19, CYP2D6, CYP2E1 and CYP3A4.

16. Method according to claims 1 to 15 wherein the at least one probe compound is selected from the group consisting of phenacetin, coumarin, tolbutamide, phenytoin, mephenytoin, S-mephenytoin, bufuralol, chlorzoxazone, midazolam, caffeine, dapsone, diclofenac, debrisoquine, bupropion, antipyrine, dextromethorphan, warfarin, diazepam, alprazolam, triazolam,

flurazepam, chlodiazepoxide theophylline, phenobarbital propranolol, metoprolol, labetalol, nifedipine, digitoxin, quinidine, mexiletine, lidocaine, imipramine, flurbiprofen, omeprazole, terfenadine, furafylline, codeine, nicotine, sparteine, erythromycin, benzoylcholine, butrylcholine, paraoxon, para-aminosalicylic acid, isoniazid, sulfamethazine, 5-fluorouracil, trans-stilbene oxide, D-penicillamine, captopril, ipomeanol, cyclophosphamide, halothane, zidovudine, testosterone, acetaminophen, hexobarbital, carbamazepine, cortisol, oltipraz, cyclosporin A and paclitaxel.